Characterization and device physics of polymer semiconducting devices with metal oxide contacts

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Stellingen

behorende bij het proefschrift

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1. The performance of inverted solar cells with an ITO/ZnO cathode, fabricated through the low temperature decomposition of $Zn(acac)_2$, is equivalent to cells made in the conventional bottom anode, top cathode geometry (chapter 2).
2. A short, low temperature annealing step of $Zn(acac)_2$ under ambient conditions is sufficient to produce electrically well-performing ZnO electron transport layers in organic semiconductor devices (chapter 3).
3. All-solution processed polymer light-emitting diodes with two ohmic contacts can be fabricated with enhanced air stability by employing metal oxide transport layers (chapter 4).
4. Dispersions of PEDOT:PSS can be modified by addition of Dimethylaminoethanol to increase the pH value and these dispersions can then be used in the charge recombination layer together with ZnO to create organic tandem solar cells (chapter 5).
5. The diffusion current in organic metal-insulator-metal diodes with one ohmic and one non-ohmic contact can be analytically modeled by adapting the classical diffusion current derivations to the appropriate boundary conditions (chapter 6).
6. By deriving equations for the influence of the Gaussian density of states of organic semiconductors on barrier lowering, the injection-limited current from a non-ohmic contact in organic metal-insulator-metal diodes can be analytically derived (chapter 7).
7. Van uitstel komt uiteindelijk ook wel eens inzicht.